

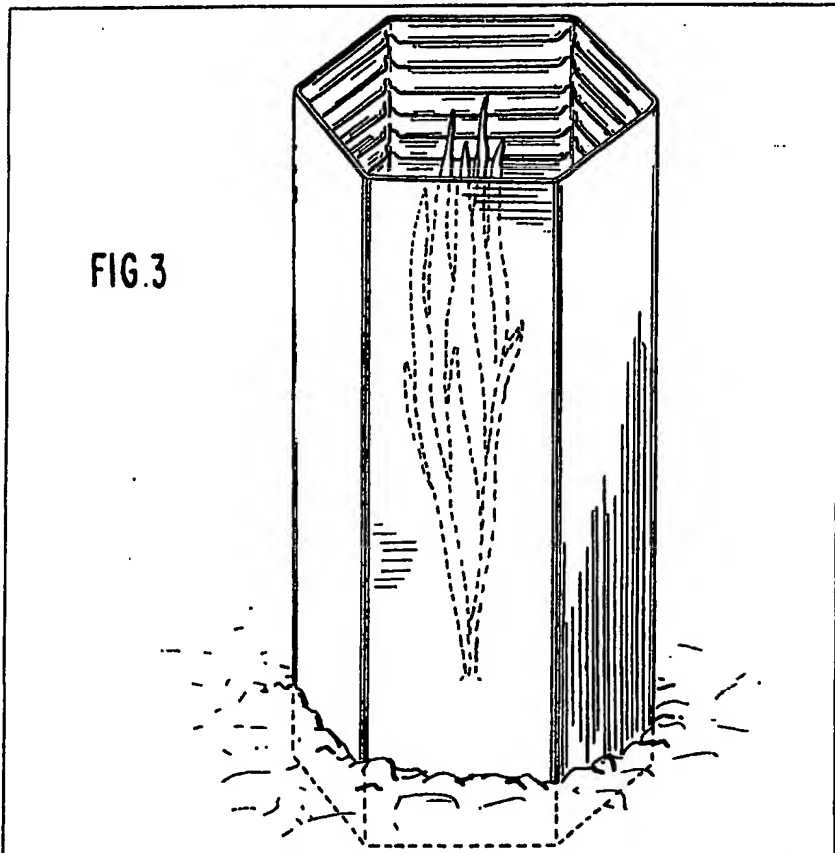
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(54) Young plant protection device under after the plant is removed or harvested.

(57) A young plant protection device comprises a plurality of side panel members of such a configuration as to form a multisided cylindrical tube open at the top and bottom, the device being formed of a layer of corrugated paper and a layer of smooth paper.

The device is for protecting young plant or seedlings when they are first transferred from the sheltered environment of a greenhouse to the open field where they may be exposed to severe weather conditions of high wind and heavy rain. The device is designed to last for up to two or three weeks and is formed of a biodegradable material and water-soluble adhesive to that with the action of the weather it will decompose and deteriorate sufficiently so that it may be plowed



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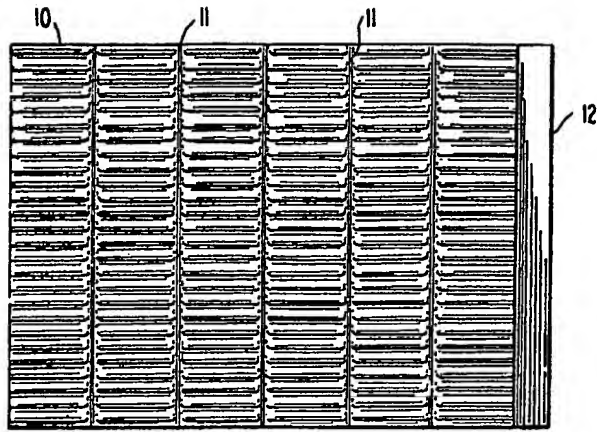


FIG. 1

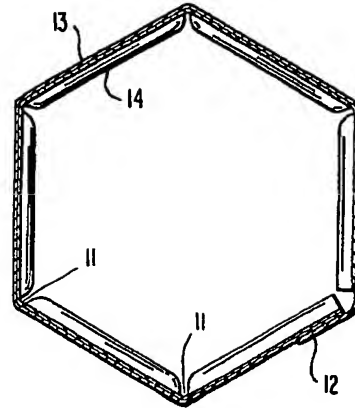


FIG. 2

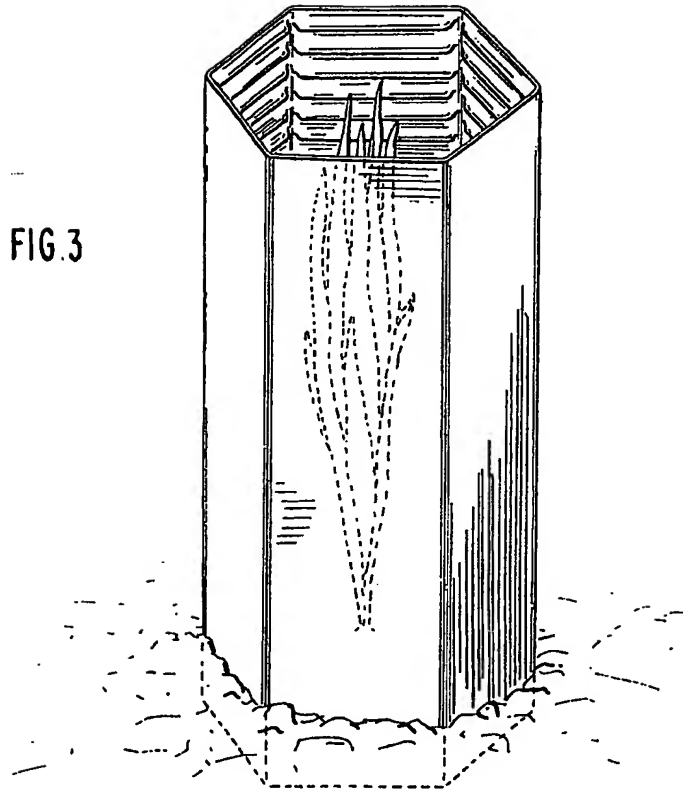


FIG. 3

## SPECIFICATION

### Young plant protection device

5 The present invention relates to a young plant protection device which is formed of a plurality of paper elements, e.g. paperboard, cardboard or kraft paper elements, of such a configuration as to form a multisided cylindrical tube open at the top and bottom. This article is suitable for protecting young plants or seedlings of any variety when they are first transferred from the sheltered environment of a greenhouse to the open field where they are exposed to possibly severe weather conditions of high wind and heavy rain.

Young plants or seedlings that are started in greenhouses are very sensitive to the move from the greenhouse to the open field. While in the greenhouse, the young plants are sheltered and protected from wind and heavy rain and are therefore susceptible to damage when transferred to the environment of an open field. Growers have experienced considerable losses in young plants freshly transplanted to the field, particularly because of wind damage. The high winds in some geographical areas result in a high percentage of losses in young plants which are unable to resist the force and chilling effect of the wind. When combined with heavy rains, the high wind can be devastating to a young crop of seedlings which are not yet acclimatised to their new surroundings.

The wind protection tube of the present invention is designed to protect young plants and to enable them to acclimatise themselves to the new environment in the field within a period of a few weeks, usually two or three weeks. After the passage of the amount of time, the plants are large enough and have been acclimatised sufficiently to their new environment so that they can withstand the temperature and wind conditions and develop and grow without the protection of the device of this invention. Therefore, the wind protection device of the present invention is produced and fabricated of biodegradable paper materials which, upon being acted on by the rain, will gradually deteriorate over a period of two or three weeks. Eventually, the product will decompose and may be plowed under into the field after the plants have been harvested or removed.

The wind protection device of the present invention is formed of a multisided cylindrical tube which is open at the top and bottom. In cross section, the tube is a regular polygon with 4 to 8 sides, preferably six. It is formed of at least one layer of corrugated paper, usually kraft paper and at least one smooth layer of paper, such as kraft paper, which is bonded to the corrugated member along the valleys of the corrugated member with a water-soluble adhesive, such as a starch glue

or paste. The panel formed by adhering the smooth layer to the corrugated layer is then scored for folding along fold lines to form the poly sided tube. The smooth member has an overlapping flat whereby the ends of the panels which meet can be adhered together to form the resulting wind protection structure.

In accordance with the present invention, heat is retained by the device in such a way to help in protecting the young plants from chilling which might result in damage to the plant.

The present invention will now be further described with reference to the accompanying drawings, in which:-

Figure 1 is a plan view of the panel used to form the device of the present invention;

Figure 2 is a cross-sectional view of the assembled wind protection device; and

Figure 3 is an isometric view of the wind protection device in the field.

Described in further detail, Fig. 1 shows the panel 10 with fold lines 11 dividing the panel into six equal size portions. End flap 12 is dimensioned so that it will overlap a portion of the abutting panel portion when folded in the final configuration as shown in cross-section view Fig. 2.

As shown in Fig. 2, the panel is formed by a layer of smooth paper 13 and a layer of corrugated paper 14 sealed along the valleys of the corrugated paper. Generally, the corrugated layer will form the interior surface of the tubular structure.

Fig. 3 shows the device surrounding a young plant as used in the field.

The height and diameter of the tube of the invention may vary according to the size and type of young plant to be protected. Generally, the tube is about 4 to 7 inches high, preferably about six inches. Expressed in the metric scale, this ranges from about 10 cm to about 18 cm, preferably about 15 cm. The diameter of the device may also vary as desired, generally between 2 to 4 inches, preferably about 2 1/2 to 3 inches when expanded or open in actual use.

This would be about 5 cm to 10 cm, preferably about 6 to 8 cm.

In practice, the tubular device of the invention is used to place over and around young plants after they are transferred from the greenhouse to an open field. The tube is pressed into the dirt of the field around the plant to a depth sufficient to resist capsizing or knock down by wind which may be impinging upon the plant in the field. Generally, the depth to which the tube is positioned in the field will be up to about 1-2 inches.

It has been determined that the corrugations in the interior of the structure will assist in holding the tube in place in the field. The corrugations are usually oriented generally parallel to the ground or horizontal plane.

The panel may be shipped to the grower for

assembly and gluing of the end flap in the field, or if desired, the tubular structure with end flap sealed may be shipped in a flat condition to the grower. Because of the biodegradable nature of the product of the invention, additional labour costs which would be required to remove the protection devices from the growing plants are saved. At about the time the plants are sufficiently grown to withstand the elements and adequately acclimatised to the temperature conditions in the field, the protection device of the invention will have disintegrated. Later, after the plants are harvested or removed, the remaining paper on the ground may simply be plowed under.

#### CLAIMS

1. A folding blank for folding into a tube for protection of young plants in the field comprising a plurality of side panels foldable along fold lines and forming a multisided cylindrical tube, which is open at the top and bottom and which is sealed along two adjacent side panel members forming the multisided cylindrical tube, said panels being formed of at least one layer of corrugated paper and at least one layer of smooth paper, said layers being sealed together by a water-soluble adhesive, and said paper being biodegradable.
2. A folding blank as claimed in claim 1, wherein one of said adjacent side panel members has a overlapping paper flap member which seals to the abutting other of said adjacent side panel members when assembled into a multisided tube.
3. A folding blank as claimed in claim 1 or claim 2 which is from about four to about seven inches (about 10 to about 18 cm) in height.
4. A folding blank as claimed in claim 3, which is about six inches (about 15 cm) in height.
5. A folding blank as claimed in any of claims 1 to 4 which is about two to about four inches (about 5 to about 10 cm) in diameter.
6. A folding blank as claimed in claim 5, which is about two and a half to about three inches (about 6 to about 8 cm) in diameter.
7. A folding blank as claimed in any of claims 1 to 6, wherein said corrugated paper is paperboard, cardboard or kraft paper.
8. A folding blank as claimed in any of claims 1 to 7, wherein said smooth paper is paperboard, cardboard or kraft paper.
9. A folding blank as claimed in any of claims 1 to 8, wherein said panels are formed of a monolayer of corrugated paper and a monolayer of smooth paper.
10. A folding blank substantially as hereinbefore described with reference to the accompanying drawings.
11. A multisided cylindrical tube open at

the top and bottom being formed of a plurality of paper panel members, the cylindrical tube being formed of at least one layer of corrugated paper and at least one layer of smooth paper, said layers being sealed together with a water-soluble adhesive and said paper being biodegradable, said panel members being sealed together by means of an overlapping portion of paper and said cylinder being polygonal in cross-section.

12. A cylindrical tube as claimed in claim 11, which is hexagonal in cross-section.

13. A cylindrical tube as claimed in claim 11 or claim 12, which is from about four to about seven inches (about 10 to about 18 cm) in height.

14. A cylindrical tube as claimed in any of claims 11 to 13, which is about six inches (about 15 cm) in height.

15. A cylindrical tube as claimed in any of claims 11 to 14, which is from about two to about 4 inches (about 5 to about 10 cm) in diameter.

16. A cylindrical tube as claimed in claim 15, which is about two and a half to about three inches (about 6 to about 8 cm) in diameter.

17. A cylindrical tube as claimed in any of claims 11 to 16, wherein said corrugated paper is paperboard, cardboard or kraft paper.

18. A cylindrical tube as claimed in any of claims 11 to 17, wherein said smooth paper is paperboard, cardboard or kraft paper.

19. A cylindrical tube as claimed in any of claims 1 to 18, which is formed of a monolayer of corrugated paper and a monolayer of smooth paper.

20. A cylindrical tube substantially as hereinbefore described with reference to the accompanying drawings.

21. A method of protecting young plants from wind damage when transferred from the greenhouse to the field comprising removing said plants from the greenhouse, planting them in an open field, placing a wind protection device over the plant and securing said device into the field by pressing the device into the dirt to a depth sufficient to retard the capsizing of said device in high wind, wherein said wind protection device is a cylindrical tube as claimed in any of claims 11 to 20.